In the United States Patent and Trademark Office

In re the Application of:

Steven Edward Atkin	)	
Serial Number: 09/891,341	)	Group: 2654
Docket Number: AUS920010642US1	)	Examiner: Angela A. Armstrong
Filed on: 06/26/2001	)	
For: "Bi-Directional Domain Names"	)	

APPEAL BRIEF

Real Party in Interest per 37 CFR §41.37(c)(1)(i)

The subject patent application is owned by International Business Machines Corporation of Armonk, NY.

Related Appeals and Interferences per 37 CFR §41.37(c)(1)(ii)

None.

Status of Claims per 37 CFR §41.37(c)(1)(iii)

Claims 1 - 15 are finally rejected. The rejections of Claims 1 - 15 are appealed.

Status of Amendments after Final Rejections per 37 CFR §41.37(c)(1)(iv)

Claims 1, 5, and 9 were amended after the final rejection in order to correct typographical errors which led to rejections under 35 U.S.C. §112.

Summary of the Claimed Subject Matter per 37 CFR §41.37(c)(1)(v)

The invention solves a need in the art a system and method which allows domain names to be handled and displayed with different (non-English) reading orders.   The invention is readily usable within the currently deployed technologies of the World Wide Web, and compatible with existing methods and systems such as Unicode's BiDi algorithm. In order to provide this solution, the invention unambiguously determines the display order of multilingual domain names by implementing the correct semantics of the full stop "." or "dot" character, as well as the hypen-minus "-" character as used within domain names, and providing a one-to-one logical order to display order conversion function.   Each domain name is broken into a plurality of individual labels separated by the full stop character, and each individual label is independently evaluated for proper bidirectional display order. The resulting mapping of logical order to display order provides unambiguous resolution of multilingual domain names.

More specifically, claim 1 sets forth a method for accomplishing this solution as follows:

(a)   establishing a plurality of labels within a unidirectional domain name by using a pre-determined full stop punctuation mark as a delimiter between said labels, said labels having an original label display order as encountered from left to right (pg. 17 lines 9 - 16);

(b)   within each said label, performing inferencing through resolving the direction of indeterminate characters by assigning a strong direction left or right to each indeterminate character (pg. 22 line 3 - pg. 23 line 3); and

(c)   reordering said characters within each said label of said unidirectional domain name into character display order using the fully resolved characters previously inferenced (pg. 22 lines 3 - 8; Table 3; pg. 25 line 12 - pg. 26 line 15), thereby converting said uni-directional domain name to a bidirectional domain name in which said original label display order is preserved, and bidirectionality of characters within each label is produced (pg. 7 lines 1 - 10; pg. 25 line 18 - pg. 26 line 4).

Claim 5 sets forth a computer readable medium encoded with software (pg. 8 lines 12 - 15) for accomplishing this solution, wherein the software performs the steps of:

(a)   establishing a plurality of labels within a unidirectional domain name by using a pre-determined full stop punctuation mark as a delimiter between said labels, said labels having an original label display order as encountered from left to right (pg. 17 lines 9 - 16);

(b)   within each said label, performing inferencing through resolving the direction of indeterminate characters by assigning a strong direction left or right to each indeterminate character (pg. 22 line 3 - pg. 23 line 3); and

(c)   reordering said characters within each said label of said unidirectional domain name into character display order using the fully resolved characters previously inferenced (pg. 22 lines 3 - 8; Table 3; pg. 25 line 12 - pg. 26 line 15), thereby converting said uni-directional domain name to a bidirectional domain name in which said original label display order is preserved, and bidirectionality of characters within each label is produced (pg. 7 lines 1 - 10; pg. 25 line 18 - pg. 26 line 4).

Claim 9 sets forth a system for accomplishing this solution including:

(a)   a label definer adapted to establish a plurality of labels within a unidirectional domain name by using a pre-determined full stop punctuation mark as a delimiter between said labels, said labels having an original label display order as encountered from left to right (pg. 17 lines 9 - 16);

(b)   an inferencer adapted to, within each said label, resolve the direction of indeterminate characters by assigning a strong direction left or right to each indeterminate character (pg. 22 line 3 - pg. 23 line 3); and

(c)   a character reorderer adapted to reorder said characters within each said label of said unidirectional domain name into character display order using the fully resolved characters previously inferenced (pg. 22 lines 3 - 8; Table 3; pg. 25 line 12 - pg. 26 line 15), thereby converting said uni-directional domain name to a bidirectional domain name in which said original label display order is

preserved, and bidirectionality of characters within each label is produced (pg. 7 lines 1 - 10; pg. 25 line 18 - pg. 26 line 4).

Grounds for Rejection For Which Review is Sought per 37 CFR §41.37(c)(1)(vi)

Review by the Board is requested of:

(a)   rejections of Claims 1 - 15 under U.S.C. §112, second paragraph, for insufficient antecedent basis and indefiniteness;

(b)   rejections of Claims 1, 5, 9, and 13 - 15 under 35 U.S.C. §102(e) as being anticipated by U.S. patent 6,738,827 to Abir (hereinafter "Abir"); and

(c)   rejections of Claims 2 - 4, 6 - 8, and 10 - 12 under 35 U.S.C. §103 as being obvious over Abir in view of U.S. Patent 6,275,789 to Moser (hereinafter "Moser").

Arguments per 37 CFR §41.37(c)(1)(vii)

Rejections of Claims 1 - 15 under U.S.C. §112, Second Paragraph

In the final Office Action, independent claims 1, 5 and 9, and all claims which depend from them, were rejected under 35 U.S.C. §112 for lack of antecedent basis for "said by using a pre-determined full stop" recited in each independent claim. This was intended to read "[[said]] a unidirectional domain name by using a pre-determined full stop", referring to the main function recited in the claim preambles of converting a unidirectional domain name (as the input or starting point) to a bidirectional domain name (as the output or ending point). By " pre-determined full stop punctuation mark", Appellant is referring to commonly used punctuation marks used in normal language to end sentences and expressions, such as the Latin period "." (see paras. [0022]. [0053] - [0055], [0061], [0066] - [0067], [0076], and Table 4).

Appellant has submitted an amendment to claims 1, 5, and 9, concurrently with the present Appeal Brief which cures this typographical error. Entry of the amendment was requested whereas it removes an issue for consideration in Appeal, it does not add new matter, and it does not present new issues for examination (e.g. conversion of a unidirectional domain name to a bidirectional domain name was previously recited in the claims).

Reversal of the rejections under §112 is requested.

Rejections of Claims 1, 5, 9, and 13 - 15 under 35 U.S.C. §102(e) over Abir

In response to the first Office Action, in independent claims 1, 5, and 9 were amendment to specifically recite the function of the invention in which a URL or web address is broken into "labels" by parsing it at points where "full stop" characters appear. Full stop characters are characters in natural language that often are used to end a sentence, for example, but in URL's and web addresses, are used a delimiters of sorts. For example, the web address:

http://www.anycompany.com

which has two full stop characters in it, the first following "www" and the other preceding "com".

In the rationale for the final rejections, the Examiner addresses this amendment to the

claims by interpreting Abir's disclosure at col. 4 lines 22 - 42 and col. 6 lines 14 - 31 as properly anticipating this claimed step, element or limitation under 35. U.S.C. §102(e).

Appellant points out that neither passage actually discusses using the period or "dot" character as a delimiter, not does either passage mention breaking the entirety of the web address into labels between the full stop characters.   In another example, consider the web addresses:

$$http://www.help.ibm.com \qquad (1)$$

and:

$$http://help.servers.ibm.com \qquad (2)$$

Appelant's invention, as claimed, would break the first address into four labels according to the full stop character placement: (a) http://www, (b) help, (c) ibm, and (d) com.   Likewise, appellant's invention, as claimed, would bread the second address into four labels as such: (a) http://help, (b) serverse, (c) ibm, and (d) com.

Now, consider the passages relied upon for the rejection from Abir:

> 1. Conversion Algorithm. Referring now to FIG. 1, there is illustrated the "conversion" algorithm for transforming a
> 25 conventional resource identifier into a friendly resource identifier. (For purposes of this disclosure of this preferred embodiment of the transformation algorithm, the set of characters of the non-Latin written language used are the Hebrew characters.) In step 100, standard parts of conven-
> 30 tional resource identifiers such as "http://www" "com" and "htm" are identified. In step 102, the standard parts are converted to well-known Hebrew equivalents such as ןןׁ דׁדׁ־ for "http://www" and םׁ ט for "com". In step 104, the remaining parts of the conventional resource
> 35 identifier is analyzed for words that have identifiable meanings. For example, the words "health" and "insurance" would be recognized in the word "healthinsurance". In step 106, the Hebrew word ןׁ ׁ׳ ׳ׁ ׁׁ would be substituted for "health" and the Hebrew word ןׁ ׁ ׳ׁ would be substi-
> 40 tuted for insurance. In step 108, the complete Hebrew resource identifier would be produced.

Abir col. 4 lines 22 - 42

1. On the fly strictly URL translation from Latin to native
15 language address system. Surfers that arrive at locations that
are not a part of the portal address assignment system (that
is, any Web site located on the World Wide Web) will also
see in the URL box their own native language rather then
Internet protocol. When the surfer, whether through a portal
20 or through the use of the desk top based option, arrives at
non-system users Web site, the transformation algorithms
will operate. For example, the address in the case of the
address http://www.healthinsurance.com, the system will
isolate the part of the address that comes after "http://www"
25 and before the ".com" (also after the ".com" for sub sites.)
The system will then convert the words into the Web surfer's
native language using the system's simple English Hebrew
dictionary. In this case health insurance. Then the system
may reverse the order of the Hebrew words add the Hebrew
30 variation of the "http://www" and the ".com", and display
the address in the surfer's native language.

Abir col. 6 lines 14 - 31

Please notice that there is no mention in either of these passages of using the period character "." or a full stop character for parsing, but instead Abir's system "isolates the part of the address that comes after the 'http://www' and before the '.com' ". So, in example number (1) above, Abir would not create four labels as we have claimed, but would "isolate" the string "help.ibm". In the second example, Abir would not create four labels, either, but instead would fail because no "http://www" appears in the address (e.g. 'www' is omitted).

In response to the first Office Action, Appellant also specifically pointed out patentable differences between Abir and the originally filed claims.   Appellant pointed out that, for reference during consideration of reply remarks, a domain name or Universal Resource Locator ("URL") is defined by those in the industry has having a protocol identifier (e.g. http or https, etc.), a top-level identifier (e.g. .com, .org, .net, etc.), a registered domain server name or second-level identifier, an optional third-level identifier (e.g. www, www2, etc.), zero or more subdomains, zero or more subdirectories, and zero or more resource names.

For example, in the URL:

http://www.support.ibm.com/index.htm

The protocol identifier is "http://" for hypertext transfer protocol, the top-level identifier is ".com", the registered domain server name with extension is "ibm", the subdomain is "support", the third-level identifier is "www", and the resource is the HTML document named "index.htm". Each of these portions of the domain name is separated by a Latin period "." character, except for the protocol identifier and the optional third-level identifier.

It is possible to have sub-subdomains, such as the following where "linux" is the subdomain of the subdomain of "support":

http://www.linux.support.ibm.com/index.htm

Note that a period "." character is used again to delimit the sub-subdomain from the third-level identifier "www" and the subdomain "support".

Abir, however, teaches a first step or phase of converting an English or Latin-based domain name by identifying pre-determined "standard parts" of a URL, such as the strings "http://www", ".com", or "HTM" (see figure 1 #100, col. 4 lines 29 - 31). These "standard parts" are exchanged for alternate language (e.g. Hebrew in their example) strings of characters (fig. 1 #102, col. 4 lines 31 - 36), which are not compatible with the Internet Protocol or Domain Name Server protocols.

In other words, Abir first converts any top-level portions, third-level portions, file extensions, and protocol identifiers to pre-determined alternate language characters or strings. Note that no parsing of the URL is specified, but just finding of pre-determined "standard portions" is disclosed. These can be referred to as "standard portions" by Abir because there are a finite set of options for these portions of a URL (e.g. http, ftp, www, .com, .org, .edu., .gov, .co, .htm, .php, .jsp, .html, etc.)

Then, Abir teaches treating the entire set of characters which are not "standard parts" as a

string to be converted to the alternate language using word-for-word conversion, and letter-for-letter conversion when words are not recognized. Abir discloses reversing the order of words if the alternate language is a right-to-left interpreted language.

Please note that Abir is silent as to maintaining the original order of the subdomains and domain names, and is silent as to using the "." character as a full stop character while independently reordering the characters within each portion between the full stop characters.

When applying conventional natural language translation techniques, a Latin period "." character is typically interpreted as signaling the end of a sentence construct within a paragraph, unless it is immediately followed by a paragraph termination character, such as a hard line feed ("LF") or carriage return ("CR") character. So, for example, if the *words of* the phrase:

"I own a dog. It is a good dog. <CR>"

were re-ordered for right-to-left languages and interpreted using conventional natural language translation techniques, it would appear in the following order:

"dog good a is It. dog a own I."

Notice that the *sentences* reversed order, as well as the words within the sentences. This is a fundamental problem of the Unicode Bidirectional Algorithm ("BIDI") as applied to domain names, which arises due to the fact that the algorithm was designed to process natural language text (e.g. sentences and paragraphs), not URLs. This is also a problem unrecognized and unsolved by Abir, as Abir is silent regarding processing of the portions *between full stop delimiters*.

For example, using the Unicode BIDI process or Abir process, the following URL:

http://www.applyforaloan.bigbank.com

would be recognized as two sentences, and would be reordered for right-to-left readers as follows (including character reordering):

         <A>knabgib.naolarofylppa<B>

where <A> is Abir's substitution for "http://www", and <B> is Abir's substitution for ".com".   Note that the reversal of the order of the "sentences" has now made the domain name incorrectly ordered (e.g. "bigbank" became a subdomain, and "applyforaloan" became a domain name).

Our invention, however, first parses the URL by using a full stop character (e.g. ".") as a delimiter between "labels".   So, in the example of:

<u>http://www.applyforaloan.bigbank.com</u>

Our invention would find four "labels" in this example URL:

Label_1 = "http://www"
Label_2 = "applyforaloan"
Label_3 = "bigbank"
Label_4 = "com"

The characters *within each label* are then re-ordered according to right-to-left reading order for recognized words in the target alternate language, independent of the content of the other labels:

Label_1' = "http://www"
Label_2' = " naolarofylppa"
Label_3' = "knabgib"
Label_4' = "com"

Because Appellant's invention *preserves the original order* of the labels (e.g. doesn't treat them as sentences within a paragraph as the Unicode process does), the proper relationship of the portions of the URL are preserved while the characters within the portions are reversed for right-to-left reading:

http://www.naolarofylppa.knabgib.com

Abir is silent as to parsing the URL into labels using a full-stop character is a delimiter between labels, reordering of the characters *within each label*, and producing a URL having the labels in the original order of the original URL but with the reordered characters within the labels. Appellant's first amendment clarified and specified this difference.

In summary, Abir teaches handling of URLs by separating out "standard portions" and then translating everything in between the standard portions as if it were natural language text, not dividing the URL into labels according to full stop characters as label delimiters, preserving the original order of the labels, and reordering characters within labels, as we have claimed. Thus, Appellant requests reversal of the rejections, and allowance of claims 1, 5, 9, and 13 - 15 as amended.

Rejections of Claims 2 - 4, 6 - 8, and 10 - 12 under 35 U.S.C. §103 over Abir in view of Moser

In the final Office Action, independent claims 2 - 4, 6 - 8, and 10 - 12 were rejected under 35 U.S.C. §103(a) as being unpatentable over Abir in view of US Patent 6,275,789 to Moser (hereinafter "Moser"). The rationale for these rejections was unchanged from the rationale presented in the first Office Action.

In the rationale, Moser was employed to teach Appelant's claimed handling of hyphen-minus characters as white space. However, Moser is silent as to using full stop delimiter to divide the URL into labels, reorder the characters within the labels, and then produce a URL having the character-reordered labels in the original label order, as previously discussed.

Therefore, Abir in view of Moser fails to teach all of the claimed elements, steps, and limitations as discussed in the foregoing paragraphs. Appellant requests reversal of the rejections, and allowance of claims 2 - 4, 6 - 8, and 10 - 12, as well as allowance of new claims 13 - 15.

Respectfully,

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Claims Appendix

per 37 CFR §41.37(c)(1)(viii)

Clean Form of Amended Claims

Claim 1 (previously presented):

A method for converting a unidirectional domain name to a bidirectional domain name, said method comprising the steps of:

establishing a plurality of labels within a unidirectional domain name by using a pre-determined full stop punctuation mark as a delimiter between said labels, said labels having an original label display order as encountered from left to right;

within each said label, performing inferencing through resolving the direction of indeterminate characters by assigning a strong direction left or right to each indeterminate character; and

reordering said characters within each said label of said unidirectional domain name into character display order using the fully resolved characters previously inferenced, thereby converting said uni-directional domain name to a bidirectional domain name in which said original label display order is preserved, and bidirectionality of characters within each label is produced.

Claim 2 (original):

The method as set forth in Claim 1 wherein said step of inferencing comprises the steps of:

first, assigning a right-to-left direction to Arabic and Hebrew letters;

second, assigning a left-to-right direction to full stop characters and other alphabetic characters;

third, resolving the directions of digits; and

fourth, resolving the directions of hyphen-minus characters.

Claim 3 (original):

The method as set forth in Claim 2 wherein said step of resolving the directions of digits comprises the steps of:

assigning a right-to-left direction to all Arabic numerals; and

assigning a left-to-right direction to all European numerals, unless a
European numeral is surrounded by right-to-left characters such as Arabic or
Hebrew letters, in which case it is assigned a right-to-left direction.

Claim 4 (original):

The method as set forth in Claim 2 wherein said step of resolving the
directions of hyphen-minus characters comprises:

assigning a left-to-right direction to all hyphen-minus characters which
are not surrounded by characters whose direction is right-to-left; and

assigning a right-to-left direction to all hyphen-minus characters which
are surrounded by characters whose direction is right-to-left.

Claim 5 (previously presented):

A computer readable medium encoded with computer executable software for
converting a unidirectional domain name to a bidirectional domain name, said software
when executed causing a computer to perform the steps of:

establishing a plurality of labels within a unidirectional domain name by using a
pre-determined full stop punctuation mark as a delimiter between said labels, said labels
having an original label display order as encountered from left to right;

within each said label, performing inferencing through resolving the direction of
indeterminate characters by assigning a strong direction left or right to each
indeterminate character; and

reordering said characters within each said label of said unidirectional domain
name into character display order using the fully resolved characters previously
inferenced, thereby converting said uni-directional domain name to a bidirectional
domain name in which said original label display order is preserved, and bidirectionality
of characters within each label is produced.

Claim 6 (original):

The computer readable medium as set forth in Claim 5 wherein said software for inferencing comprises software for performing the steps of:

first, assigning a right-to-left direction to Arabic and Hebrew letters;

second, assigning a left-to-right direction to full stop characters and other alphabetic characters;

third, resolving the directions of digits; and

fourth, resolving the directions of hyphen-minus characters.

Claim 7 (original):

The computer readable medium as set forth in Claim 6 wherein said software for resolving the directions of digits comprises software for performing the steps of:

assigning a right-to-left direction to all Arabic numerals; and

assigning a left-to-right direction to all European numerals, unless a European numeral is surrounded by right-to-left characters such as Arabic or Hebrew letters, in which case it is assigned a right-to-left direction.

Claim 8 (original):

The computer readable medium as set forth in Claim 6 wherein said software for resolving the directions of hyphen-minus characters comprises software for performing the steps of:

assigning a left-to-right direction to all hyphen-minus characters which are not surrounded by characters whose direction is right-to-left; and

assigning a right-to-left direction to all hyphen-minus characters which are surrounded by characters whose direction is right-to-left.

Claim 9 (previously presented):

A system for converting a unidirectional domain name to a bidirectional domain name comprising:

a label definer adapted to establish a plurality of labels within a unidirectional domain name by using a pre-determined full stop punctuation mark as a delimiter between said labels, said labels having an original label display order as encountered from

left to right;

an inferencer adapted to, within each said label, resolve the direction of indeterminate characters by assigning a strong direction left or right to each indeterminate character; and

a character reorderer adapted to reorder said characters within each said label of said unidirectional domain name into character display order using the fully resolved characters previously inferenced, thereby converting said uni-directional domain name to a bidirectional domain name in which said original label display order is preserved, and bidirectionality of characters within each label is produced.

Claim 10 (original):

The system as set forth in Claim 9 wherein said inferencer comprises:

a first direction assignor for assigning a right-to-left direction to Arabic and Hebrew letters;

a second direction assignor for assigning a left-to-right direction to full stop characters and other alphabetic characters;

a third direction assignor for resolving the directions of digits; and

a fourth direction assignor for resolving the directions of hyphen-minus characters.

Claim 11 (original):

The system as set forth in Claim 10 wherein said third direction assignor comprises:

a right-to-left direction assignor for all Arabic numerals, and for all

European numerals which are surrounded by right-to-left characters such as Arabic and Hebrew letters; and

a left-to-right direction assignor for all European numerals which are not surrounded by right-to-left characters such as Arabic or Hebrew letters.

Claim 12 (original):

The system as set forth in Claim 10 wherein said fourth direction assignor comprises:

a left-to-right direction assignor for all hyphen-minus characters which are not surrounded by characters whose direction is right-to-left; and

a right-to-left direction assignor for all hyphen-minus characters which are surrounded by characters whose direction is right-to-left.

Claim 13 (previously presented):

The method as set forth in Claim 1 wherein said pre-determined full stop punctuation mark used as a delimiter between said labels comprises a Latin period punctuation mark.

Claim 14 (previously presented):

The computer-readable medium as set forth in Claim 5 wherein said pre-determined full stop punctuation mark used as a delimiter between said labels comprises a Latin period punctuation mark.

Claim 15 (previously presented):

The system as set forth in Claim 9 wherein said pre-determined full stop punctuation mark used as a delimiter between said labels comprises a Latin period punctuation mark.

Evidence Appendix

per 37 CFR §41.37(c)(1)(ix)

No evidence has been submitted by applicant or examiner pursuant to 37 CFR §§1.130, 1.131, or 1.132.

Related Proceedings Appendix

per 37 CFR §41.37(c)(1)(x)

No decisions have been rendered by a court or the Board in the related proceedings as identified under 37 CFR §41.37(c)(1)(ii).